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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,647	11/24/2003	Andrew J. Cobley	51152-2 DIV	4689

7590 06/05/2006

John J. Piskorski
c/o EDWARDS & ANGELL, LLP
Dike Bronstein, Roberts & Cushman, IP Group
130 Water Street
Boston, MA 02109

EXAMINER	
ZHENG, LOIS L	
ART UNIT	**PAPER NUMBER**
1742	

DATE MAILED: 06/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/720,647	COBLEY ET AL.	
	Examiner	Art Unit	
	Lois Zheng	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *52-64* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *52-64* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *27 October 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claims 1-51 are canceled in view of the preliminary amendment filed 24 November 2003. Therefore, claims 52-64 are currently under examination.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 52-64 are rejected under 35 U.S.C. 102(b) as being anticipated by Okinaka et al. US 4,469,564(Okinaka).

Okinaka teaches an apparatus for copper electroplating comprising an non-consumable anode, a cathode, and power source(col. 2 lines 33-57). Okinaka further teaches that the copper electroplating is carried out by passing current through the anode, the electroplating solution and the cathode(col. 2 lines 33-36). The electroplating solution of Okinaka comprises additives to increase ductility, such as organic polysulfide compounds(col.6 lines 3-25), and additives to improve the brightness, such as phenazine azo dyes(col. 4 line 56-col. 5 line 65),

Regarding claims 52-53, the organic polysulfide compounds listed in Table 1 of Okinaka meets the structural limitations of the additive consumption inhibiting compound as recited in claims 52-53.

Regarding claims 52-53, the phenazine azo dyes as taught by Okinaka meets the structural limitation of the additive consumption inhibiting compound as recited in claims 52 and 54.

Regarding claim 55, Okinaka further teaches that the concentration of organic polysulfide compounds is between 0.0005 and 1.0g/l(col. 6 lines 14-15), which reads on the claimed concentration of about 0.001 to about 100.0g/l.

Regarding claim 56, Okinaka teaches the claimed brighteners, ductility modifiers and suppressors(col. 1 lines 51-56, col. 4 lines 27-33).

Regarding claim 57, Okinaka further teaches that the electroplating bath can be an acidic bath(col. 2, lines 43-44), which meets the claimed pH limitation of from 0 to about 8.

Regarding claim 58, Okinaka teaches the claimed copper sulfate in the electroplating bath.

Regarding claim 59-62, Okinaka teaches that the electroplating apparatus comprises a non-consumable anode made of materials such as platinum, platinized titanium. Okinaka also teaches that non-consumable anodes such as iridium and/or tantalum oxide covered titanium electrodes are particularly useful. Okinaka further teaches that the anodes comprise binder metals such as beryllium, strontium, etc. Okinaka further teaches adding brightener ductility modifier to the electroplating bath to improve various aspects of the plating process(col. 1 lines 50-56, col. 4 lines 24-33). Therefore, Okinaka teaches all limitations in claims 59-62.

Regarding claim 63, Okinaka further teaches electroplating of circuit boards, which meets the limitation of instant claim 63.

Regarding claim 64, the claim limitation with respect to current density is directed to how the claimed apparatus can be operated(i.e. process limitation), therefore, does not lend patentability to the instant apparatus claim. As stated in MPEP 2114 [R-1], it is well settled that the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus as long as the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

4. Claims 52-54, 57-58 and 63-64 are rejected under 35 U.S.C. 102(b) as being anticipated by Holtzman et al. US 4,891,069(Holtzman).

Holtzman teaches copper electroplating of circuit boards(abstract). The electroplating apparatus of Holtzman includes an anode, a cathode and power source for providing current between the anode and the cathode(col. 29, lines 12-17). Holtzman further teaches an electroplating bath comprising an adjuvant (promoter), wherein the adjuvant (promoter) may be a heterocyclic compound containing two heteroatoms such as C,N,S,O or a combination thereof. The heterocyclic compound is a saturated, partially unsaturated or unsaturated five or six member ring such as thiophene, furan, pyran, pyrrole, pyrrolidine, etc. The heterocyclic compound of Holtzman further comprises two R groups and two to about 3 -OH groups, wherein the R groups may be hydrogen, lower alkyl such as a straight or branched alkyl group from 1 to about 6 carbon atoms, NH_2, $CONH_2$, COOH, SO_3H, SSH. The R groups can be the

same or different. They can be hydrogen or when taken with the heterocyclic ring forming naphthalene, quinoline, etc. (col. 24 line 31 – col. 25 line 10).

Regarding claims 52 and 58, Holtzman further teaches that the copper electroplating bath comprises copper sulfate(col. 23 line 46 col. 24 line 8). Since the source of copper to be plated is from the copper electroplating bath, the examiner concludes that the anode used in the apparatus of Holtzman is inherently an insoluble anode. In addition, the polyhydroxy heterocyclic compounds as taught by Holtzman reads on the additive consumption inhibiting compound as claimed.

Regarding claim 53, Holtzman further teaches the addition of sulfuric acid in the electroplating bath(col. 23 lines 62-67). The sulfuric acid as taught by Holtzman also reads on the claimed additive consumption inhibiting compound as claimed.

Regarding claim 54, the types of polyhydroxy heterocyclic compounds as taught by Holtzman meets the structural limitation of the claimed additive consumption inhibiting compounds.

Regarding claim 57, Holtzman teaches that the sulfuric acid is present in the electroplating bath in the amount of 10-200 ml/l(col. 23 lines 62-66). Holtzman further implies that the electroplating bath is acidic(col. 25 lines 39-46). Therefore, the examiner concludes that the electroplating bath of Holtzman is inherently acidic which reads on the claimed pH of from 0 to about 8.0.

Regarding claim 63, the circuit board as taught by Holtzman meets the limitation of the instantly claimed cathode.

Regarding claim 64, the claim limitation with respect to current density is directed to how the claimed apparatus can be operated(i.e. process limitation), therefore, does not lend patentability to the instant apparatus claim. As stated in MPEP 2114 [R-1], it is well settled that the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus as long as the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Even if the claimed current density of about 1 to about 1000 amps/square feet(i.e. about 0.1076 –107.6 amps/square decimeter) were to be given patentable weight, the claimed current density is still anticipated by the Holtzman since Holtzman teaches an electroplating current density of about 1 to about 10 amps/square decimeter(col. 27 lines 7-13).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holtzman.

The teachings of Holtzman are discussed in paragraph 4 above.

Holtzman further teaches that the electroplating bath comprises about 0.4 to about 8 parts of an adjuvant (promoter)(col. 23 lines 50-55). Therefore, when polyhydroxy heterocyclic compounds are used as the adjuvant(promoter), they would be

in the amount of about 0.4 to about 8 parts. Even though Holtzman does not explicitly teach an additive consumption inhibiting compound concentration of about 0.001g/ to about 100 g/l as claimed, one of ordinary skill in the art would have found it obvious that the amount polydroxy heterocyclic compounds as taught by Holtzman overlaps the claimed amount of additive consumption inhibiting compound. Therefore, a prima facie case of obviousness exists. See MPEP 2144.05. The selection of claimed additive consumption inhibiting compound amount range from the disclosed heretocyclic compound amount range of Holtzman would have been obvious to one skilled in the art since Holtzman teaches the same utilities in its' disclosed hydroxyl heretorcyclic compound amount range.

7. Claims 56 and 59-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holtzman in view of Okinaka et al. US 4,469,564(Okinaka).

The teachings of Holtzman are discussed in paragraph 4 above. However, Holtzman does not explicitly teach the presence of additives as recited in claim 56 in the coating bath. Holtzman also does not teach the claimed insoluble anode materials.

The teachings of Okinaka are discussed in paragraph 3 above.

Regarding claim 56, it would have been obvious to one of ordinary skill in the art to have incorporated the additives such as brightener and ductility modifier as taught by Okinaka into the electroplating coating bath of Holtzman in order to improve various aspects of the plating process as taught by Okinaka.

Regarding claims 59-62, it would have been obvious to one of ordinary skill in the art to have incorporated the non-consumable anode of Okinaka into the electroplating

apparatus of Holtzman in order to the achieve long lifetimes and stability as taught by Okinaka (col. 2 lines 51-55).

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 52-64 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 60-73 of copending Application No. 10/720,972. Although the conflicting claims are not identical, they are not patentably distinct from each other because 10/720,972 teaches an electroplating apparatus that is structurally the same as the instant invention and containing substantially similar additive consumption inhibiting compound in the plating solution.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LLZ

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

FORM PTO-1449 INFORMATION DISCLOSURE STATEMENT	ATTY DOCKET NO. 51152-2 DIV	SERIAL NO. 10/720,647
	APPLICANT(S): Cobley et al.	
	FILING DATE: 11/24/2003	ART UNIT: Not Yet Assigned

UNITED STATES PATENT DOCUMENTS

EXAM. INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FIL. DATE IF APPR
	AA	3,328,273	06/1967	Crentz et al.			
	AB	3,956,079	05/1976	Kardos et al.			
	AC	3,960,677	06/1976	Hildering et al.			
	AD	4,419,192	12/1983	Dahms			
	AE	4,469,564	09/1984	Okinaka et al.			
	AF	5,433,840	07/1995	Dahms et al.			
	AG	2003/0010642	01/2003	Taylor et al.			

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRAN YES/NO
	BA	30 11 697 A1	10/1981	Germany			
	BB	0 255 558	02/1988	Europe			
	BC	53-77843 A	07/1978	Japan			
	BD	1652383 A1	05/1991	Russia			

OTHER DOCUMENTS (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.)

	CA	Patent Abstracts of Japan, Vol. 006, No. 073 (C-101), May 8, 1982 & JP 57 009893 a (Seiko Epson Corp), Jan. 19, 1982.

Examiner:	Date: 5/23/06

Notice of References Cited	Application/Control No. 10/720,647	Applicant(s)/Patent Under Reexamination COBLEY ET AL.	
	Examiner Lois Zheng	Art Unit 1742	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-4,891,069	01-1990	Holtzman et al.	106/1.15
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
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	N					
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	P					
	Q					
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	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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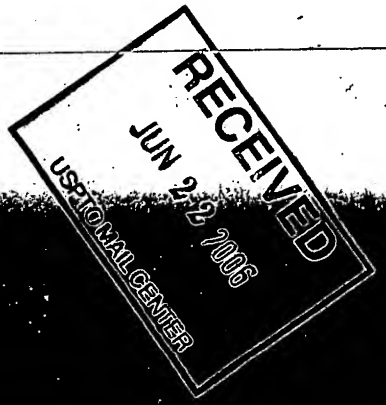

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